

WHAT IS CLAIMED IS:

- 1 1. A controller for use with a power train of a power converter including a switch
2 configured to conduct for a duty cycle, comprising:
3 an oscillator configured to provide a clock signal having multiple phases; and
4 a modulator configured to select a phase of said clock signal as a function of a portion of
5 a digital duty cycle signal to refine a resolution of said duty cycle and provide a signal to control
6 said duty cycle of said switch as a function of said digital duty cycle signal.
- 1 2. The controller as recited in Claim 1 wherein said modulator is configured to provide a
2 pulse width modulated signal to control said duty cycle of said switch.
- 1 3. The controller as recited in Claim 1 wherein said digital duty cycle signal includes least
2 and most significant bits, said modulator being configured to select said phase of said clock
3 signal as a function of said least significant bits of said digital duty cycle signal to refine said
4 resolution of said duty cycle.
- 1 4. The controller as recited in Claim 1 wherein said digital duty cycle signal includes least
2 and most significant bits, said modulator being configured to provide said signal to control said
3 duty cycle of said switch as a function of said least and most significant bits of said digital duty
4 cycle signal.
- 1 5. The controller as recited in Claim 1 wherein said oscillator is a ring oscillator.
- 1 6. The controller as recited in Claim 1 wherein said modulator comprises a multiplexer, a
2 counter, at least one flip-flop and a frequency divider.

1 7. The controller as recited in Claim 1 further comprising a duty cycle processor configured
2 to provide said digital duty cycle signal.

1 8. A method of controlling a duty cycle of a switch of a power train of a power converter,
2 comprising:

3 providing a clock signal having multiple phases;

4 selecting a phase of said clock signal as a function of a portion of a digital duty cycle
5 signal to refine a resolution of said duty cycle; and

6 supplying a signal to control said duty cycle of said switch as a function of said digital
7 duty cycle signal.

1 9. The method as recited in Claim 8 wherein said supplying comprises supplying a pulse
2 width modulated signal to control said duty cycle of said switch.

1 10. The method as recited in Claim 8 wherein said digital duty cycle signal includes least and
2 most significant bits, said selecting comprising selecting said phase of said clock signal as a
3 function of said least significant bits of said digital duty cycle signal to refine said resolution of
4 said duty cycle.

1 11. The method as recited in Claim 8 wherein said digital duty cycle signal includes least and
2 most significant bits, said supplying comprising supplying said signal to control said duty cycle
3 of said switch as a function of said least and most significant bits of said digital duty cycle
4 signal.

1 12. The method as recited in Claim 8 wherein said providing is performed by a ring
2 oscillator.

1 13. The method as recited in Claim 8 wherein said digital duty cycle signal includes least and
2 most significant bits, said supplying employing trailing edge modulation of said digital duty

3 cycle signal in accordance with said least and most significant bits to derive said signal to control
4 said duty cycle of said switch.

1 14. The method as recited in Claim 8 further comprising furnishing said digital duty cycle
2 signal prior to said act of selecting.

1 15. A power converter, comprising:
2 a power train including a switch configured to conduct for a duty cycle and provide a
3 regulated output characteristic at an output of said power converter; and
4 a controller, including:
5 an oscillator configured to provide a clock signal having multiple phases; and
6 a modulator configured to select a phase of said clock signal as a function of a
7 portion of a digital duty cycle signal to refine a resolution of said duty cycle and provide a signal
8 to control said duty cycle of said switch as a function of said digital duty cycle signal.

1 16. The power converter as recited in Claim 15 wherein said modulator is configured to
2 provide a pulse width modulated signal to control said duty cycle of said switch.

1 17. The power converter as recited in Claim 15 wherein said digital duty cycle signal
2 includes least and most significant bits, said modulator being configured to select said phase of
3 said clock signal as a function of said least significant bits of said digital duty cycle signal to
4 refine said resolution of said duty cycle, said modulator further being configured to provide said
5 signal to control said duty cycle of said switch as a function of said least and most significant bits
6 of said digital duty cycle signal.

1 18. The power converter as recited in Claim 15 wherein said oscillator is a ring oscillator.

1 19. The power converter as recited in Claim 15 wherein said modulator comprises a
2 multiplexer, a counter, at least one flip-flop and a frequency divider.

1 20. The power converter as recited in Claim 15 wherein said controller further comprises a
2 duty cycle processor configured to provide said digital duty cycle signal and said power

- 3 converter further comprises a driver configured to provide a drive signal to said switch based on
- 4 said signal provided by said modulator.